

Attachment 4. Work Plan (refers to schedule and budget attachments)

Scope of work: The research will field test a combined algal and cattail water treatment system for the removal of Se and other contaminants from river water. This novel system, which was developed from a mesocosm study at UC Berkeley, is designed to generate a clean water supply for the SCH or other habitat related projects. Its efficiency for pollutant removal will be tested using a 16-cell pilot treatment system to be constructed by the Imperial Irrigation District on a site adjacent to the Alamo River.

The main goal of this project is to create, develop and monitor a constructed wetland water treatment system (CWTS) to provide clean water for the Species Conservation Habitat at the Salton Sea (SCH). We are requesting funding in the amount of \$1,065,993 to cover UC Berkeley research over the 3-year period, January 1, 2013 to December 31, 2015. UC Berkeley is collaborating with the Imperial Irrigation District (IID), which will provide funding in the amount of \$355,350 to cover the initial construction of the CWTS as well as partial funding of the operation and maintenance of the facility over the 3-year period.

The CWTS wetland design was developed from CADWR-funded studies carried out by UC Berkeley (April 1, 2010 to the present). The proposed Salton Sea CWTS will be built in January 2013 by our collaborator, IID, at a 10-acre site near the Alamo River. The experiments will be initiated in February 2013 and monitoring will begin May 2013 (see *Attachment 5*). In the second and third years, this work will be continued in the field to investigate the long-term performance of the CWTS.

To carry out Tasks 2 through 7 (see Schedule, *Attachment 5*), a team of 2 postdoctoral scholars (a wetland ecologist and a microbiologist/chemist) and 1 laboratory assistant (to help with laboratory work ~15h/week) will be required. The salaries and benefits of the researchers (which constitute the main expense over the 3-year period) increase every year at the rate indicated in the budget below (*Attachment 6B*). Additional expenses will be incurred for the operation and maintenance of the CWTS facility, travel expenses, chemical analyses (Se, N, P and S, etc), x-ray absorption spectroscopy at SSRL (for Se speciation), as well as miscellaneous materials and supplies essential to the research monitoring program.

Postdoctoral scholars will visit the CWTS at the Salton Sea to conduct field surveys every month. Once we have gathered the field samples, the researchers will make 3 trips every year to Stanford Synchrotron Radiation Light Source (SSRL) at Stanford University to conduct Se speciation analyses. Expenses that include monthly field trips to the Salton Sea, trips to the SSRL at the Stanford University and delivery of soil and river water from the Salton Sea to the laboratory at UC Berkeley are calculated in the 'other direct costs' section of the budget with a total of \$460,980 over three years. UC Berkeley is asking for \$90,000 dollars (\$30,000 each year) from the FAP grant to cover their share in the Operation and Maintenance (O & M) costs of the CWTS. IID will cover \$52,200 per year of the O & M expenses. UC Berkeley charges 25% of the direct costs as overhead (25% is the overhead rate for state agencies grants and is referred to as "indirect costs"). For Tasks 2-7 it is difficult to breakdown the costs by task. This is because the tasks overlap and use many of the same materials. Also, in research one is often confronted

with deviations in the proposed plan that may be more or less expensive than planned. To accomplish Tasks 8 and 9 UC Berkeley is requesting 5% of the total direct costs for project administration (for such activities as purchasing, preparation of monthly cost reports to CADWR, as well as quarterly research progress reports to CADWR and IID). The itemized costs to perform the proposed research by UC Berkeley are summarized in the attached Budget sections below (*Attachment 6*).